Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

The Immersed Interface Method with Triangular Mesh Representation of an Interface[1] SHENG XU, Southern Methodist University — The immersed interface method can be employed to solve an interface problem on a fixed Cartesian grid by incorporating necessary interface-induced Cartesian jump conditions into numerical schemes. In this talk, we present ideas to compute the necessary Cartesian jump conditions from given principal jump conditions using triangular mesh representation of an interface. The triangular mesh representation is simpler and more robust than interface parametrization for a complex or non-smooth interface. We test our ideas by using the computed Cartesian jump conditions in the immersed interface method to solve a Poisson equation subject to an interface with the shape of a sphere, cube, cylinder or cone. Our results demonstrate expected second-order accuracy in the infinity norm.

[1]This work is supported by the NSF grant DMS 1320317.

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Date submitted: 04 Aug 2014 Electronic form version 1.4